

# vb6 Portable Vibration Data Collector

## Datasheet

Bently Nevada Machinery Condition Monitoring

111M7155 Rev. E



### Description

The vb6 Portable Vibration Data Collector instrument is a portable four channel, high resolution vibration data collector. It is ergonomically designed and lightweight for all day comfort. You can use this device for on-route as well as off-route data collection.

The vb6 Portable Vibration Data Collector samples all four channels simultaneously to provide recordings with up to 12,800 lines of resolution and up to 40 kHz Fmax. Our patented adaptive settling algorithm and 6Pack recording system offer quick, one-step data recording.

The data collector has plenty of storage and long battery life, and is backed by a five year warranty.

The vb6 Portable Vibration Data Collector is one of Bently Nevada hardware monitoring assets that work with System 1 Evolution software.

### The vb6 Portable Vibration Data Collector offers the following features:

- Four channel simultaneous recordings
- 12,800 lines FFT resolution
- Supports triaxial sensors
- Supports 40 kHz Fmax
- 1 GB memory
- $\geq 95$  dB dynamic range
- Supports voltage-output sensors
- Spectrum and waveform recordings
- Demodulation for early detection of rotating machinery problems such as bearing faults
- Unique 6Pack recording system



- User-defined recordings for temperature, pressure, mass flow, force and power
- Cable test mode
- Option to add flex features such as balancing and Remote Comms
- Upgradable Proflash system and free firmware updates for 5 years
- Five-year warranty on the instrument hardware

## Specifications

### Sensors

Sensor input	Four channels Simultaneous sampling
Compatible sensor types	Accelerometer, velocity, displacement, current, 4 to 20 mA, voltage output
AC coupled range	16 V peak-peak Allows for $\pm 8$ V sensor output swing ( $\pm 80$ g)
DC coupled ranges	0 V to 20 V, -10 V to 10 V, -20 V to 0 V and readings from voltage output sensors
Connectors	1 x BNC (CH1) 1 x LEMO (CH2 / CH3 / CH4) Safety feature: Break-free inline connector
Analog to digital conversion	24-bit ADC
Sensor excitation current	0 mA or 2.2 mA (configurable), 24 V maximum 2.2 mA required power for IEPE/ICP type accelerometer
Sensor detection	Warns if short circuit or not connected

### Tachometer Sensor (Optional)

Sensor type	Laser sensor with reflective tape Sensor triggers on beam reflection
Laser sensor range	10 cm to 2 m nominal Range depends on size of reflective tape

### Tachometer Input

Supported sensor types	Laser Tach, Contact, TTL Pulse, Keyphasor Instrument has optically isolated input
Power supply to sensor	5 V, 50 mA
TTL pulse rating	3.5 V (4 mA) min 28 V (5 mA) max Off-state 0.8 V
Keyphasor thresholds	7.7 $\pm$ 0.5 V 13.2 $\pm$ 0.8 V 18.5 $\pm$ 1 V Nominally 8 V, 13 V, 18 V
Speed range	10 RPM to 300,000 RPM (0.2 Hz to 5 kHz) Pulse width at least 0.1 ms
Accuracy	$\pm 0.1$ %

## Parameter Indication

Maximum levels (peak)	> 1000 g (10,000 m/s <sup>2</sup> ) > 1000 in/sec (25,000 mm/s) > 20 in (500 mm) > 10,000 Amps Effective limit is sensor sensitivity and output voltage
Dynamic signal range	> 95 dB typical at 400 line resolution
Harmonic distortion	Less than -70 dB typical Other distortions and noise are lower
Units	g or m/s <sup>2</sup> or adB in/s or mm/s or vdB mil or mm or $\mu$ m amps, user-defined 0-peak, peak-peak or RMS Auto-scale by 1000x when required US and SI options for adB and vdB
Magnitude & cursors	Overall RMS value Waveform True pk-pk Dual cursors Harmonics Digital readouts on chart
Base accuracy	$\pm 1$ % of readings approximately 0.1 dB For AC signal: % of reading For DC signal: % of full scale
High frequency attenuation	$\leq 0.1$ dB 100 Hz to 10 kHz $\leq 3$ dB >10 kHz to 40 kHz Attenuation tolerances are in addition to base accuracy.
AC coupling attenuation	$\leq 0.1$ dB 10 Hz to <100 Hz $\leq 3$ dB 1 Hz to <10 Hz
Attenuation due to Integration (normal mode)	$\leq 0.1$ dB 10 Hz to <100 Hz $\leq 1.5$ dB 1 Hz to <10 Hz Values apply to single integration. (Acceleration to velocity) Double the values for double integration (Acceleration to displacement)
Attenuation due to Integration (low frequency mode)	$\leq 0.1$ dB 1 Hz to <100 Hz $\leq 1.5$ dB 0.2 Hz to <1 Hz Applies when coupling = DC and Fmax $\leq 100$ Hz

## Waveform Display

Number of samples	1024, 2048, 4096, 8192, 16,384, 32,768
Time scale	10 ms to 512 seconds or orders based

	from 1 to 999 revs
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## Logging and Analysis

Output formats	Instrument screen, transfer to Ascent, XML
Data storage	Dual 1 GB non-volatile flash memories Database mirror copy on second flash memory
Data storage structure	Folders/machines/points/locations/routes No limits are applied 50 character names
Max folder size	10,000 measurement locations

## Spectrum Display

Fmax ranges	25, 50, 100, 125, 150, 200, 300, 400, 500, 600, 800, 1000, 1200, 1600, 2000, 2500, 3000, 4000, 5000, 6000, 8000, 10,000, 15,000, 20,000, 30,000, 40,000 Hz Or equivalent CPM values Or orders-based from 1X to 999X
Fmin possible range	0 to Fmax Instrument zeroes all spectral lines below Fmin.
Resolution	400, 800, 1,600, 3,200, 6,400, 12,800 lines 6400 lines max. for dual channel measurements 3200 lines max. for four channel measurements
Frequency scale	Hz, CPM, Orders Linear scale with zooming
Amplitude scale	Acceleration, velocity, displacement, current or user-defined Linear or log scales, auto or manual scaling
Window shapes	Hanning Rectangular
Overlap	(0, 12.5, 25, 37.5, 50, 62.5, 75, 87.5) % Depends on Fmax and number of lines
Number of averages	1, 2, 4, 8, 16, 32, 64, 128 Increases sampling time proportionally
Averaging types	Linear, exponential, peak hold
Demodulation bandwidths	23 bandwidth options From 125 Hz to 1250 Hz Up to 16 kHz to 20 kHz
6Pack	Up to 40 kHz & 3200 lines (1 channel) Up to 20 kHz & 1600 lines (3 channel) Spectrum and waveform for low-frequency, high-frequency and demodulation

Order tracking	Up to 6 kHz Fmax Orders-based Tachometer required Mounted on high-speed shaft
Order tracking - Distortion	Less than -65 dB Within 50% to 200% speed variation during recording

## Display and Communication

Display	Graphic Grayscale LCD LED Backlight
Resolution & size	480 x 320 (HVGA), 5.7" Readable in direct sunlight
Supported Languages	English, Chinese, French, German, Japanese, Portuguese, Russian and Spanish Firmware released in English, translations will follow
Communication with PC	USB or Ethernet Use PROFLASH to upgrade instrument firmware
USB host port	USB 2.0, supplying 5V, 250mA Save folders to USB flash drive

## Battery and Charger

Battery type	Custom Lithium Ion pack, 7.4 V, 5 Ah
Operating time	10 hours Backlight on — 60 second timeout
Charger type	Internal charging, automatic control External power pack 12 V DC, 3 A output
Charge rate	3 A nominal 3 hours for complete charge

## Mechanical

Size	9.9" W x 5.8" L x 2.4" H (252 x 148 x 60 mm)
Weight	2.7 lb (1.2 kg) Including battery and strap

## Environmental Limits

Operating temperature	14 °F to 122 °F (-10 to 50 °C)
Storage temperature and humidity	-4 °F to 140 °F (-20 to 60 °C), 95% RH Up to 95 F (35 C), 85% RH if storage exceeds 1 month
Ruggedness	IP65 sealed 4' (1.2 m) drop onto concrete Procedure: 26 drops following MIL-STD-810F-516.5-IV

## Compliance and Certifications

### FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

### EMC

EN 61326-1: 2012

EN 61326-2-3: 2012

EMC Directive 2014/30/EU

### Electrical Safety

EN 62133: 2002

LV Directive 2014/35/EU

### RoHS

RoHS Directive 2011/65/EU

## Hazardous Area Approvals



For the detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (108M1756) available from [Bently.com](http://Bently.com).

CSA/NRTL/C (Approval Option 01)	Class I, Division 2, Groups A, B, C, D
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## Ordering Information



For the detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (108M1756) available from [Bently.com](http://Bently.com).

### VB6-AA

#### A: Agency Approval

01	CSA
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### Basic Kit

We offer the vb6 Portable Vibration Data Collector instrument in a basic kit with the option to purchase the System 1 Evolution software and license separately.



\* Kit items below with multiple part numbers listed have limited regional availability due to certification requirements.

Part Number	Description	Qty
	vb6 Portable Vibration Data Collector four channel portable data collector	1
ACCL0547 or 200350 *	Straight accelerometers	3
ACCL0561 or 200350 *	Right-angle accelerometer or straight accelerometer	1
138M7748	Transducer cable, 4 ft. straight	4
MAGF0104	Accelerometer magnetic base	4
CABB0560	BNC to BNC cable, 1m	1
CABU0213	USB data transfer cable	1
CBTB0278	Triple BNC cable	1
110M8172-012	LEMO-BNC TTL Tach/Keyphasor cable	1
PLUS0230	Category A power plug, USA / Canada	1
PLSA0241	Category D power plug, South Africa / India	1
PLAU0228	Category M power plug, Australia / New Zealand / China	1
PLHK0245	Category G power plug, Hong Kong / UK	1
PLEU0229	Category C Power plug, Europe	1
CBVB0552	vb6 instrument carry bag	1

Part Number	Description	Qty
NKST0553	vb6 neck strap with Sensor Keeper	1
108M4044	AC power adapter	1
DCCA0041	DC car adapter	1
108M3536	SCOUT100 Series and vbSeries Quick Start Guide	1
MVBX0250	Instrument Reference guide	1

## Additional Accessories

### Software

Part Number	Description
108M4051	ASCENT Level 1
108M4052	ASCENT Level 2
3071/01	System 1 Evolution

### Hardware

Part Number	Description
100M5828	The vbSeries hard case
DTC70262	The vbSeries dust cover
BATT0575	Replacement battery pack, Li-Ion 7.4 V 5 Ah
KTTC0331	Triaxial sensor kit 100 mV/g +/- 20% Magnet 6 ft coiled cable, with breakaway connector Zone 2 and Class 1, Div 2 rating
108M4069	Laser Tach powered by vb6 Portable Vibration Data Collector
CBL50216	Five-meter laser Tach cable for 108M4069
113M5529-01	Reflective tape One roll, 60 cm (23.7 in)

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